

# SEQUENCE LISTING

<110> Li, Lian-Chao

Cosgrove, Daniel J.

<120> PLANT CELL WALL LOOSENING ACTIVITY OF GROUP 2/3 ALLERGENS OF GRASS POLLEN

<130> P06331US01

<140> US

<141> 2003-07-28

<150> US 60,399,688

<151> 2002-07-29

<160> 18

<170> PatentIn version 3.1

<210> 1

<211> 291

<212> DNA

<213> Lolium perenne

<400> 1  
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aagtacacga ggccagggga caccctggcg gaggtggagc tccggcagca cggctcggag 120  
gagtgggaac ccatgacgaa gaagggcaac ctgtgggagg tgaagagcgc caagccgctc 180

accggcccaa tgaacttccg cttcctctcc aagggcggca tgaagaacgt cttcgacgag 240  
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<210> 2

<211> 97

<212> PRT

<213> Lolium perenne

<400> 2

Thr Lys Val Asp Leu Thr Val Glu Lys Gly Ser Asp Ala Lys Thr Leu  
1 5 10 15

Val Leu Asn Ile Lys Tyr Thr Arg Pro Gly Asp Thr Leu Ala Glu Val  
20 25 30

Glu Leu Arg Gln His Gly Ser Glu Glu Trp Glu Pro Met Thr Lys Lys  
35 40 45

Gly Asn Leu Trp Glu Val Lys Ser Ala Lys Pro Leu Thr Gly Pro Met  
50 55 60

Asn Phe Arg Phe Leu Ser Lys Gly Gly Met Lys Asn Val Phe Asp Glu  
65 70 75 80

Val Ile Pro Thr Ala Phe Thr Val Gly Lys Thr Tyr Thr Pro Glu Tyr  
85 90 95

Asn

<210> 3

<211> 291

<212> DNA

<213> Artificial

<400> 3  
 acaaaagtcg atttaactgt ggagaagggt tctgacgcga agacgctggt gctgaacatc 60  
 aagtacacga ggccagggga caccctggcg gaggtggagc tccggcagca cggctcggag 120  
 gagtggaac ccctgacgaa gaagggaac ctgtgggagg tgaagagcgc caagccgctc 180  
 accggcccaa tgaacttccg cttcctctcc aaggcgga tgaagaacgt cttcgacgag 240  
 gtcacccca ccgccttcac ggtcggcaaa acctacaccc cagaatacaa t 291

<210> 4

<211> 97

<212> PRT

<213> Artificial

<400> 4

Thr Lys Val Asp Leu Thr Val Glu Lys Gly Ser Asp Ala Lys Thr Leu  
 1 5 10 15

Val Leu Asn Ile Lys Tyr Thr Arg Pro Gly Asp Thr Leu Ala Glu Val  
 20 25 30

Glu Leu Arg Gln His Gly Ser Glu Glu Trp Glu Pro Met Thr Lys Lys  
 35 40 45

Gly Asn Leu Trp Glu Val Lys Ser Ala Lys Pro Leu Thr Gly Pro Met  
 50 55 60

Asn Phe Arg Phe Leu Ser Lys Gly Gly Met Lys Asn Val Phe Asp Glu  
 65 70 75 80

Val Ile Ala Thr Ala Phe Thr Val Gly Lys Thr Tyr Thr Pro Glu Tyr  
 85 90 95

Asn

<210> 5

<211> 20  
<212> PRT  
<213> Lolium perenne

<400> 5

Thr	Lys	Val	Asp	Leu	Thr	Val	Glu	Lys	Gly	Ser	Asp	Ala	Lys	Thr	Leu
1				5					10					15	

Val Leu Asn Ile  
20

<210> 6  
<211> 52  
<212> DNA  
<213> Artificial

<220>  
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<222> (3)..(3)  
<223> N is unknown

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<222> (15)..(15)  
<223> N is unknown

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<222> (29)..(29)

<223> N is unknown

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<222> (36)..(36)

<223> N is unknown

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<222> (43)..(43)

<223> N is unknown

<400> 6  
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52

<210> 7

<211> 49

<212> DNA

<213> Artificial

<220>

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<222> (24)..(24)

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<222> (43)..(43)

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cyctyctara gttragtayc ttcnacgtgg nacgtgtrag tanacgtgt

49

<210> 8

<211> 93

<212> PRT

<213> Zea mays

<400> 8

Thr	Phe	Gln	Val	Gly	Lys	Gly	Ser	Lys	Pro	Gly	His	Leu	Val	Leu	Thr
1				5					10					15	

Pro	Asn	Ile	Ala	Thr	Ile	Ser	Asp	Val	Glu	Ile	Lys	Glu	His	Gly	Gly
			20					25					30		

Asp	Asp	Phe	Ser	Phe	Thr	Leu	Lys	Glu	Gly	Pro	Ala	Gly	Thr	Trp	Thr
		35					40					45			

Leu	Asp	Thr	Lys	Ala	Pro	Leu	Lys	Tyr	Pro	Leu	Cys	Ile	Arg	Phe	Ala
	50					55					60				

Thr	Lys	Ser	Gly	Gly	Tyr	Arg	Ile	Ala	Asp	Asp	Val	Ile	Pro	Ala	Asp
65					70					75					80

Phe	Lys	Ala	Gly	Thr	Thr	Tyr	Lys	Thr	Thr	Leu	Ser	Ile
				85						90		

<210> 9

<211> 96

<212> PRT

<213> *Dactylis glomerata*

<400> 9

Val Lys Val Thr Phe Lys Val Glu Lys Gly Ser Asp Pro Lys Lys Leu  
1 5 10 15

Val Leu Asp Ile Lys Tyr Thr Arg Pro Gly Asp Thr Leu Ala Glu Val  
20 25 30

Glu Leu Arg Gln His Gly Ser Glu Glu Trp Glu Pro Leu Thr Lys Lys  
35 40 45

Gly Asn Leu Trp Glu Val Lys Ser Ser Lys Pro Leu Thr Gly Pro Phe  
50 55 60

Asn Phe Arg Phe Met Ser Lys Gly Gly Met Arg Asn Val Phe Asp Glu  
65 70 75 80

Val Ile Pro Thr Ala Phe Lys Ile Gly Thr Thr Tyr Thr Pro Glu Glu  
85 90 95

<210> 10

<211> 90

<212> PRT

<213> *Oryza sativa*

<400> 10

Met Glu Val Ala Lys Gly Ser Ser Ala Lys Ser Leu Glu Leu Val Thr  
1 5 10 15

Asn Val Ala Ile Ser Lys Val Glu Val Lys Glu Lys Gly Gly Lys Asp

	20		25		30
Trp Val Ala Leu Lys Glu Ser Ser Ser Asn Thr Trp Thr Leu Lys Ser	35	40	45		
Glu Ser Pro Leu Lys Gly Pro Phe Ser Val Arg Phe Leu Val Lys Asn	50	55	60		
Ser Gly Tyr Arg Val Val Asp Asp Ile Ile Pro Glu Ser Phe Thr Ala	65	70	75	80	
Gly Ser Glu Tyr Lys Ser Gly Ile Gln Leu	85	90			
<210> 11					
<211> 96					
<212> PRT					
<213> Lolium perenne					
<400> 11					
Ala Ala Pro Val Glu Phe Thr Val Glu Lys Gly Ser Asp Glu Lys Asn	1	5	10	15	
Leu Ala Leu Ser Ile Lys Tyr Asn Lys Glu Gly Asp Ser Met Ala Glu	20	25	30		
Val Glu Leu Lys Glu His Gly Ser Asn Glu Trp Leu Ala Leu Lys Lys	35	40	45		
Asn Gly Asp Gly Val Trp Glu Ile Lys Ser Asp Lys Pro Leu Lys Gly	50	55	60		
Pro Phe Asn Phe Arg Phe Val Ser Glu Lys Gly Met Arg Asn Val Phe	65	70	75	80	
Asp Asp Val Val Pro Ala Asp Phe Lys Val Gly Thr Thr Tyr Lys Pro	85	90	95		



<210> 12  
 <211> 96  
 <212> PRT  
 <213> Sorghum

<400> 12  
 Gly Thr Thr Leu Thr Ile Glu Val Gly Lys Asp Ser Thr Ser Thr Lys  
 1 5 10 15  
 Leu Ser Leu Ile Thr Asn Val Ala Ile Ser Glu Val Ser Val Lys Pro  
 20 25 30  
 Lys Gly Ala Thr Asp Phe Thr Asp Asp Leu Lys Glu Ser Glu Pro Lys  
 35 40 45  
 Thr Phe Thr Leu Asp Ser Lys Glu Pro Ile Glu Gly Pro Ile Ala Phe  
 50 55 60  
 Arg Phe Leu Ala Lys Gly Gly Gly Tyr Arg Val Val Asp Asn Ala Ile  
 65 70 75 80  
 Pro Ala Asp Phe Lys Ala Gly Ser Val Tyr Lys Thr Thr Glu Gln Val  
 85 90 95

<210> 13  
 <211> 100  
 <212> PRT  
 <213> Hordeum vulgare

<400> 13  
 Ala Ala Thr Lys Val Lys Phe Thr Val Gln Lys Gly Ser Asp Ala Lys  
 1 5 10 15  
 Lys Leu Val Leu Lys Ile Asp Tyr Thr Arg Ala Gly Asp Thr Leu Ser



Asp Ile Val Pro Thr Asp Phe Lys Cys Gly Thr Thr Tyr Lys Pro Glu  
85 90 95

Ala Tyr

<210> 15

<211> 96

<212> PRT

<213> Phleum pratense

<400> 15

Val Pro Lys Val Thr Phe Thr Val Glu Lys Gly Ser Asn Glu Lys His  
1 5 10 15

Leu Ala Val Leu Val Lys Tyr Glu Gly Asp Thr Met Ala Glu Val Glu  
20 25 30

Leu Arg Glu His Gly Ser Asp Glu Trp Val Ala Met Thr Lys Gly Glu  
35 40 45

Gly Gly Val Trp Thr Phe Asp Ser Glu Glu Pro Leu Gln Gly Pro Phe  
50 55 60

Asn Phe Arg Phe Leu Thr Glu Lys Gly Met Lys Asn Val Phe Asp Asp  
65 70 75 80

Val Val Pro Glu Lys Tyr Thr Ile Gly Ala Thr Tyr Ala Pro Glu Glu  
85 90 95

<210> 16

<211> 98

<212> PRT

<213> Hordeum vulgare

<400> 16

Ala Val Pro Pro Val Ser Phe Thr Val Glu Lys Gly Ser Glu Glu Lys  
1 5 10 15

Lys Leu Ala Leu Gln Ile Lys Tyr Asp Lys Glu Gly Asp Ser Met Lys  
20 25 30

Glu Val Glu Val Lys Gln Gly Glu Glu Trp Leu Pro Leu Asn Lys Cys  
35 40 45

Ala Asn Gly Val Trp Glu Ile Lys Val Asp Glu Pro Leu Lys Gly Pro  
50 55 60

Tyr Ser Ile Arg Tyr Glu Thr Asp Lys Gly Gln Arg Asn Val Phe Asp  
65 70 75 80

Asp Val Val Pro Ala Glu Tyr Lys Ile Gly Thr Thr Tyr Lys Pro Ala  
85 90 95

Glu Pro

<210> 17

<211> 97

<212> PRT

<213> Triticum aestivum

<220>

<221> MISC\_FEATURE

<222> (27)..(27)

<223> X is unknown

<400> 17

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1                      5                      10                      15  
 Leu Ala Leu Lys Ile Asp Tyr Thr Arg Pro Xaa Asp Ser Leu Ser Glu  
                     20                      25                      30  
 Val Glu Leu Arg Gln His Gly Ser Lys Glu Trp Gln Pro Val Thr Lys  
                     35                      40                      45  
 Asn Gly Asp Val Trp Glu Val Ser Cys Ser Lys Pro Leu Val Gly Pro  
                     50                      55                      60  
 Phe Asn Phe Arg Phe Leu Ser Lys Asn Gly Met Lys Asn Val Phe Asp  
 65                      70                      75                      80  
 Glu Val Phe Ser Thr Asp Phe Lys Ile Gly Lys Thr Tyr Gln Pro Glu  
                     85                      90                      95

Tyr

<210> 18

<211> 96

<212> PRT

<213> Triticum aestivum

<400> 18

Val Lys Val Lys Leu Thr Val Gln Lys Gly Ser Asp Lys Lys Lys Leu  
 1                      5                      10                      15  
 Ala Leu Lys Ile Asp Tyr Thr Arg Pro Asn Asp Ser Leu Ser Glu Val  
                     20                      25                      30  
 Glu Leu Arg Gln Tyr Gly Ser Glu Glu Trp Gln Pro Leu Thr Lys Lys  
                     35                      40                      45  
 Gly Asp Val Trp Glu Val Ser Cys Ser Lys Pro Leu Val Gly Pro Phe  
                     50                      55                      60

Asn Phe Arg Phe Leu Ser Lys Asn Gly Met Lys Lys Val Phe Asp Glu  
65 70 75 80

Val Phe Ser Thr Asp Phe Lys Ile Gly Lys Thr Tyr Glu Pro Glu Tyr  
85 90 95